Inorganic and Organic Chemistry

SYNTHESES OF PROTON EXCHANGE MEMBRANE (PEM) MONOMERS

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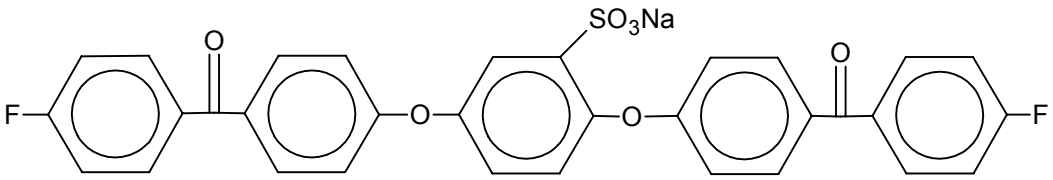
Abstract:

The PEEK monomers were synthesized and sulfonated for possible proton exchange membranes. 1,1'-(p-Phenylenedioxy)bis[4-(4-chlorobenzoyl)benzene[1] and 1,1'-(p-Phenylenedioxy)bis[4-(4-fluorobenzoyl)benzene were prepared from phosphorus pentoxide/methanesulfonic acid (PPMA)[2], 1,4-diphenoxybenzene, and p-halobenzoic acid in 82-84% yield. The fluoropoly(ether)etherketone monomer was sulfonated once on the most activated ring with oleum (20% free SO_3). The sulfonated fluoro-monomer was obtained in 50% yield as the sodium salt. IR, ^{1}H NMR, ^{13}C NMR, and two-dimensional NMR were utilized for verification of the product and purity. This monomer was the first of three to be synthesized so the effects of acidity and molecular structure on the conductivity of proton exchange membranes may be investigated.



1. Mitsuru Ueda and Fumiaki Ichikawa, *Macromolecules* **23**, 926 (1990).
2. Philip E. Eaton and Glenn R. Carlson, *J. Org. Chem.* **38**, 4017 (1973).